

and a fluorescent lamp, are formed, and, thereby, Lighting Sub-Division is performed to the peripheral face of a reel.

[0004] Said reel lighting system allocates the light sources 103, such as a filament lamp and a fluorescent lamp, inside the symbol displaying window 102 in the front panel 101, irradiates it with the light from this light source 103 from the slanting upper part to the peripheral face of the reel 104, and makes it specify a symbol, as shown in drawing 15.

[0005] As shown in drawing 16, the light source 103 like a fluorescent lamp is arranged inside the reel 104, the inner skin of the reel 104 is irradiated with the light from this light source 103 from the inside, and there is also a thing it was made to make a symbol specify.

[0006]

[Problem(s) to be Solved by the Invention] However, like the example of drawing 15, if light is illuminated from the slanting upper part to the peripheral face of the reel 104 with the light source 103, The symbol of the upper position of the peripheral face of the reel 104 looks clear brightly, since the symbol of a lower position has a far distance from the light source 103, it looks dark compared with the symbol of an upper position, and the level difference of up-and-down light and darkness produces it in the peripheral face of the reel 104.

[0007] Although it is going to stare at the symbol which moves at the time of rotation of the reel 104 and is going to stop a desired symbol, since a playing person's symbol is hard to look clear, he cannot make it stop targeting a desired symbol easily, and the fun of a game reduces him by half in a lower position. If there is furthermore a level difference of light and darkness, it is difficult for an eye to get tired easily and to make a game continue over a long time.

[0008] When it irradiates with light from the inside of the reel 104, in order for Lighting Sub-Division to have futility and to make a symbol specify vividly like the example of drawing 16, excessive light volume is needed. Therefore, when a high-output thing is used for the light source 103 or the light source 103 is made to approach the reel 104, there is fear of a reel being heated and changing.

[0009] This invention was made paying attention to the above-mentioned problem, and does not need excessive light volume, but can illuminate the peripheral face of a reel uniformly, and an object of an invention is to provide the symbol variable display game machine which can improve the visibility of a symbol.

[0010]

[Means for Solving the Problem] Two or more reels with which two or more sorts of symbols were expressed are installed in a peripheral face side by side, and this invention ahead of a reel, In a symbol variable display game machine which a front panel provided with a symbol displaying window which a peripheral face of each reel can recognize visually from the exterior is allocated, and changes, in a rear face of said front panel. In a boundary position of a symbol displaying window which adjoins each other at least, a reel lighting system for illuminating to a peripheral surface of each reel is arranged in accordance with a direction with which a reel is located in a line, and a direction which intersects perpendicularly, and it changes.

[0011] Said reel lighting system has a linear light source of a fluorescent lamp etc., and comprises an invention of Claim 2.

[0012] Said reel lighting system comprises an invention of Claim 3 with two or more

punctiform light sources, such as a light emitting diode.

[0013]In an invention of Claim 4, a light reflector made to reflect light which a reel lighting system emitted in the direction of a reel is formed between said front panel and a reel lighting system.

[0014]

[Function]Since the reel lighting system is allocated in the direction with which a reel is located in a line, and the direction which intersects perpendicularly when illuminating the peripheral face of a reel with a reel lighting system, light is uniformly irradiated by the peripheral face of a reel.

[0015]In the invention of Claim 2, since the reel lighting system comprises a linear light source of a fluorescent lamp etc., the desirable amount of illumination is given with the light source of the small number.

[0016]In the invention of Claim 3, since the reel lighting system comprises two or more punctiform light sources, such as a light emitting diode, the light volume of each point-like light source, etc. are changed and the illumination state of the peripheral face of a reel can be adjusted the optimal.

[0017]In the invention of Claim 4, since the light reflector is formed between the front panel and the reel lighting system, the light from a reel lighting system goes to a reel peripheral face without futility.

[0018]

[Example]Drawing 1 shows the appearance of the slot machine which is one working example of this invention. The body 1 of this slot machine attaches the door 3 to the front opening of the box-shaped body part 2 so that opening and closing are possible. in the hollow interior of said body part 2, it is shown in drawing 2 -- as -- an upper row position -- the circuit boards 5, such as the reel block 4 and a control circuit, -- a lower-berth position -- many -- the medal discharge machine 6 which has the hopper 6a which accommodates the medal of several sheets is incorporated, respectively.

[0019]The three reels 8a, 8b, and 8c are attached to one by the metallic frame 7, and said reel block 4 grows into it. Two or more sorts of symbols, such as a pattern, a character, and a number, are expressed to the peripheral face of each reels 8a, 8b, and 8c. Some of the symbols constitute the symbol (henceforth "a winning-a-prize symbol") for forming winning a prize.

The stepping motors 9a, 9b, and 9c which rotate individually each reels 8a, 8b, and 8c are attached to this reel block 4, and the symbol variable display device 10 is constituted with each reels 8a, 8b, and 8c.

[0020]The front face of said door 3 comprises the front panel 11 of the center for carrying out the variable display of the symbol of each reels 8a, 8b, and 8c, and the upper panel 12 and the lower panel 13 for displaying a kind name and game information. Each panels 11, 12, and 13 give silk screen printing to the surface of a transparent synthetic resin board or tempered glass, and are formed in it. The stop button switches 15a, 15b, and 15c of 14 or 3 start levers, the medal slot 16, etc. are arranged, and the medal injection hole 17 and the medal saucer 18 are arranged under the lower panel 13 under the front panel 11, respectively.

[0021]The three symbol displaying windows 20a, 20b, and 20c transparent color-free surrounded in the color printing layer 11A (shown in drawing 6) are installed in the center of a plate surface of the front panel 11 side by side. Each reels 8a, 8b, and 8c of

said reel block 4 are located behind each symbol displaying windows 20a, 20b, and 20c, and it is formed in longwise shape so that the symbol of a reel peripheral face can recognize visually by three pieces at the time of a reel stop.

[0022]As shown in drawing 3, in the bottom into a top, a total of five slanting stopping lines L1-L5 are expressed with the surface of the front panel 11 so that the symbol displaying windows 20a, 20b, and 20c may be crossed.

The symbol of each reels 8a, 8b, and 8c aligns on these stopping lines L1 - L5 at the time of a reel stop.

If there is an injection number of sheets of the medal to said medal slot 16, and only the number of the one central stopping lines L1 is two and that of the three stopping lines, the upper inside and the bottom, L1-L3 is three, as for these stopping lines L1-L5, all the five stopping lines L1-L5 will be validated, respectively.

[0023]In the slot machine of the above-mentioned composition, if a medal is thrown in from the medal slot 16, the stopping lines of the number according to the injection number of sheets will be validated. Subsequently, operation of the start lever 14 will start the three reels 8a, 8b, and 8c all at once. Whenever the stop button switches 15a, 15b, and 15c are operated after this, the corresponding reels 8a, 8b, and 8c stop. If the combination of a predetermined symbol is organized on the validated stopping lines at this time, it will be winning a prize and the medal of a specified number will be emitted to the medal saucer 18 by the operation of the medal expenditure machine 6 from the medal injection hole 17.

[0024]As shown in drawing 4 inside said front panel 11, the rectangular wiring case 22 is located by the front shape which has the opening 21 which encloses the periphery of the symbol displaying windows 20a, 20b, and 20c, and this wiring case 22 is fixed to the rear face of the front panel 11 with a screw thread (not shown) etc.

[0025]In the wiring case 22, corresponding to the boundary position of the symbol displaying window which adjoins each other among the symbol displaying windows 20a, 20b, and 20c, the two fluorescent lamps 24 and 24 for illuminating to the peripheral face of each reels 8a, 8b, and 8c are arranged, and the reel lighting system 23 is constituted.

[0026]Each fluorescent lamps 24 and 24 are made into longitude, and are arranged in the effective area of the wiring case 22 so that it may meet in the direction (longitudinal direction) with which the reels 8a, 8b, and 8c are located in a line, and the direction (sliding direction) which intersects perpendicularly like drawing 3. If the direction with which each reels 8a, 8b, and 8c are located in a line is a sliding direction, each fluorescent lamps 24 and 24 will be sideways arranged so that a longitudinal direction may be met.

[0027]The light reflectors 25 and 25 of about V type are arranged, and the plane shape for reflecting the light of the fluorescent lamp 24 between the front panel 11 and each fluorescent lamps 24 and 24, in the direction of each reels 8a, 8b, and 8c, as shown in drawing 4 and drawing 5 is held at the wiring case 22, respectively.

[0028]Also between adjacent reels, the light reflectors 26 and 26 of a convex surface are arranged, the reflector is supported by said metallic frame 7, further, a reflector is arranged by the method of both sides of a reel, the light reflectors 27 and 27 of a concave curve are arranged for inner, and it is supported by the metallic frame 7.

[0029]In drawing 4, 28 is the stop-lamp fitting part provided in the lower part of the rear face of the wiring case 22, and 29 is another lamp fitting part provided in the one side part of the rear face of the wiring case 22.

[0030]After powering on makes the two fluorescent lamps 24 and 24 always turn on, and illuminates to the peripheral face of the reels 8a, 8b, and 8c. Since each fluorescent lamps 24 and 24 are formed in longitude as the direction and direction crossing at a right angle where the reels 8a, 8b, and 8c are located in a line, and this example show to drawing 6, the light by each fluorescent lamps 24 and 24 illuminates equally the vertical section of the peripheral face of the reels 8a, 8b, and 8c, and the level difference of up-and-down light and darkness is not produced.

[0031]Since each fluorescent lamps 24 and 24 are arranged corresponding to each boundary position of the adjacent reel display windows 20a, 20b, and 20c, respectively, the fluorescent lamps 24 and 24 do not appear from the exterior, and the space between the front panel 11 and the reel block 4 is also used effectively.

[0032]Still like this example, the light from each fluorescent lamps 24 and 24 can be efficiently employed by preparing a proper place the light reflectors 25, 26, and 27 that there is no futility in Lighting Sub-Division of each reels 8a, 8b, and 8c. In this case, if \*\*\*\*\* or a fluorescence agent is applied to the reflector of the light reflectors 26 and 27, the reflector of the light reflectors 26 and 27 will emit light with the light from each fluorescent lamps 24 and 24, and a light effect will improve.

[0033]Drawing 7 is what added and formed the fluorescent lamps 24 and 24 in the both-the-right-and-left-ends position of the wiring case 22 other than the two above mentioned fluorescent lamps 24 and 24 as the reel lighting system 23, respectively, and can perform sufficient Lighting Sub-Division for the whole region of the reels 8a, 8b, and 8c.

[0034]The fluorescent lamp 31 is arranged sideways and it may be made to constitute the reel lighting system 23 with each longitudinal fluorescent lamps 24 and 24 on the upper surface of the wiring case 22, as shown in drawing 8. In this case, if the luminescent color of the fluorescent lamps 24 and 31 is changed, multicolor Lighting Sub-Division can be performed to the peripheral face of the reels 8a, 8b, and 8c.

[0035]Drawing 9 is what replaced with the fluorescent lamp 24 and attached the ultraviolet radiation lamps 41 and 41 to longitude at the position of said two fluorescent lamps 24 and 24, and constitutes the reel lighting system 23 with the fluorescent lamp 31 attached sideways at the upper surface of the wiring case 22.

[0036]If the specific symbol of working example of drawing 9 is effective in the slot machine using the reel drawn with ultraviolet luminous paint and the ultraviolet rays from each ultraviolet radiation lamps 41 and 41 are emitted to the symbol drawn with said ultraviolet luminous paint, A symbol absorbs ultraviolet rays and carries out colored luminescence with the color which fluorescent ink has, for example, red. As shown in drawing 10, since each ultraviolet radiation lamps 41 and 41 are formed in accordance with the direction with which each reels 8a, 8b, and 8c are located in a line, and the direction which intersects perpendicularly, ultraviolet rays are uniformly irradiated with them to the peripheral face of each reels 8a, 8b, and 8c, and the luminescence unevenness of the symbol by a position does not have them.

[0037]Drawing 11 is replaced with the two fluorescent lamps 24, and working example which uses the cold cathode fluorescent lamp 51 of the shape of one U character is shown. Since said cold cathode fluorescent lamp 51 is U type, the ridges 51a and 51b are made to correspond to the boundary position of each symbol displaying window, and it makes and arranges them. Since it replaces with the cold cathode fluorescent lamp 51, a non-electrode fluorescent lamp etc. can be used and the electrode is provided only in the

end of the pipe in the case of the non-electrode fluorescent lamp, wiring is simple.

[0038]Drawing 12 attaches the side luminescence type optical fibers 61 and 61 to the wiring case 22 in accordance with the direction with which each reels 8a, 8b, and 8c are located in a line, and the direction which intersects perpendicularly corresponding to the boundary position of an adjacent symbol displaying window. Since the this side luminescence type optical fiber 61 has small calorific value compared with the fluorescent lamp 24 etc., it is effective in energy saving. Since this optical fiber 61 is incurvated circularly and can be arranged along a reel peripheral face, much more uniform Lighting Sub-Division is possible for it. It can replace with the optical fiber 61 and EL fiber can also be used.

[0039]Although a linear light source like a fluorescent lamp is used for each of above-mentioned working example as a light source of a reel lighting system, as shown in drawing 13, it can also constitute the reel lighting system 71, using a punctiform light source like a light emitting diode two or more. The boundary position of each adjacent symbol displaying windows 20a, 20b, and 20c and the position of the outside of the symbol displaying windows 20a and 20c on either side are aligned at linear shape, and the reel lighting system 71 of the figure arranges two or more punctiform light sources 72 in them, respectively. Each point-like light source 72 is arranged in the lengthwise direction which intersects perpendicularly with the direction with which each reels 8a, 8b, and 8c are located in a line. As the punctiform light source 72, it may replace with a light emitting diode and a filament lamp may be used.

[0040]In this working example, the light volume of each point-like light source 72 is changed, the illumination state to the peripheral face of each reels 8a, 8b, and 8c can be adjusted, and also the luminescent color of some punctiform light sources 72 is changed, and change can also be given to the displaying condition of a symbol. It is also possible to use combining two or more punctiform light sources 72 and a linear light source like said fluorescent lamp 24 or the ultraviolet radiation lamp 41.

[0041]

[Effect of the Invention]This invention is located in the boundary of the symbol displaying window which adjoins the rear face of a front panel at least like the above, Since the reel lighting system for illuminating to the peripheral face of each reel was arranged in accordance with the direction which intersects perpendicularly the direction with which a reel is located in a line, uniform Lighting Sub-Division which does not have a level difference of up-and-down light and darkness in the peripheral face of a reel can be performed. As a result, since a playing person's eye is not tired and the symbol of a reel looks clear, at the time of reel rotation, it becomes easy for a playing person to aim at a desired symbol, and he can perform a game with a sufficient temper.

[0042]In the invention of Claim 2, since the reel lighting system was constituted with the linear light source of a fluorescent lamp etc., the light source of the small number can give the desirable amount of illumination.

[0043]In the invention of Claim 3, since the reel lighting system was constituted with two or more punctiform light sources, such as a light emitting diode, the light quantity of each point-like light source is changed and the illumination state of the peripheral face of a reel can be adjusted the optimal.

[0044]In the invention of Claim 4, since the light reflector reflected in the direction of a reel provided the light from a reel lighting system between the front panel and the reel